DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Ferro Corporation

Facility Address: 7050 Krick Road, Walton Hills, Ohio

Facility EPA ID #: OHD 004 161 410

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   ___ If no - re-evaluate existing data, or

   ___ if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of AMigration of Contaminated Groundwater Under Control@ EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **contaminated**[1] above appropriately protective levels (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes -continue after identifying key contaminants, citing appropriate levels, and referencing supporting documentation.

____ If no - skip to #8 and enter YE status code, after citing appropriate levels, and referencing supporting documentation to demonstrate that groundwater is not contaminated.

____ If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

Current Conditions Report (Hull and Associates, 2011)

Site Background

The Ferro Walton Hills facility is a polymer and additives manufacturing facility for a wide range of applications included adhesives, antimicrobials and wire and cable. The Site is approximately 13.8 acres and contains numerous manufacturing and office buildings. The Site is surrounded by other industrial facilities, including TJ Tool Works and Clarke's Family Trucking to the west, Hukill Chemical Corporation and the former Bedford Anodizing to the north, National Rolled Thread Die Co. to the east and TR Wigglesworth Machinery Co to the south. The southern facility boundary is Treat Road, while Krick Road makes up the eastern and a portion of the northern boundary of the facility. The Bedford Anodizing Facility makes up the remaining portion of the northern Site boundary. See Figure 4 attached.

Prior to Ferro acquiring the Site, the eastern portion of the Site was owned by Chase Dryer, a company who manufactured paint drying additives. The western portion of the Site was formerly owned by Bedford Anodizing. Planned future use of the Site is for commercial/industrial land use. The surrounding land use consists of commercial/industrial, and vacant properties.

The US EPA completed a PA/VSI for the facility on January 24, 1992, which included identification of ten Solid Waste management Areas (SWMUs) and no Areas of Concern (AOCs). A secondary US EPA site visit on August 11, 2010 identified five additional SWMUs. Utilizing the PA/VSI and secondary US EPA site visit as a starting point, Ferro completed a CCR for the Site that identified nine SWMUs and two AOCs, in addition to the SWMUs previously identified by the US EPA. Based on information included in the US EPA PA/VSI, the US EPA secondary Site visit and the information obtained during the completion of the CCR, it was determined that a total of 8 SWMUs and two AOCs required further investigation. The SWMUs investigated are #s 3,7,11,14,15,21,22 and 24; the AOCs are #s 1 and 2.

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[1] Contamination and contaminated describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate levels (appropriate for the protection of the groundwater resource and its beneficial uses).

Geology/Hydrogeology

Review of soil boring logs and monitoring wells completed at the Site indicates that the majority of the Site is covered by three distinct stratigraphic units.

- Unit #1 is fill material that ranges from 0 feet to 20 feet with an average thickness of 12.0 feet (Urban Land). The fill material encountered typically consists of construction/demolition debris in a clayey to silty matrix located near the surface. In some instances this unit supports a thin vegetative layer.

- Unit #2 is a brown silty clay loam that ranges from 1.0 feet to 15.5 feet with an average thickness of 7.0 feet. The thickness of Unit #2 is highly dependent on the thickness of Unit #1.

- Unit #3 consists of gray weathered shale encountered at depths ranging from 12 to 25 feet bgs. Based on well logs at the Site, the bedrock surface appears to display a slight dip to the west along an east west transect, but is approximately 10.0 feet shallower in the southern portion of the Site than the northern portion of the Site.**

  **The Ohio Division of Geological Survey (ODGS) Bedrock Topography of the Northfield, Ohio, Quadrangle map (1996) indicates that bedrock at the Site is fairly flat lying and displays a gentle slope to the northwest.

Groundwater elevations recorded following the well installations indicate that the major water bearing unit at the Site is located at the silty clay, shale interface and that the groundwater encountered exhibited characteristics of confined conditions.

Groundwater elevations rose up in their casings approximately 13.4 feet, on average. Groundwater at the Site, flows along the bedrock surface of Unit #3, and within the weathered portions of this unit. Based on the available information (i.e., water levels, boring logs, field observations) it appears that groundwater is in communication with the unnamed tributary to Tinkers Creek. Based on the groundwater surface elevations, groundwater beneath the Site flows predominantly to the northwest, with the exception of the western portion of the Site. In the western portion of the Site, due to the influence of the unnamed tributary to Tinkers Creek, groundwater flow is both south onto the Site and north towards the former stream. See Figure 6 attached.

Groundwater Use

The City of Cleveland currently provides potable water to the Site. No evidence of use of groundwater as a potable water source was evident at the Site. In the surrounding area, there are twenty-six wells identified by ODNR that are likely private water supply wells. According to information provided by the Cuyahoga County Auditor, twenty three of the well locations are connected to a municipal water supply. The three properties that are not connected to the municipal water supply, and likely use their well as a source of potable water, are installed to depths ranging between 100 and 178 feet bgs. Two of the wells are installed into the sandstone unit that directly underlies the shale unit that was encountered at the Site. The sandstone unit was encountered 97 and 98 feet bgs. The third potable well that appears to be in use is installed into a

shale aquifer, which was encountered 162 feet bgs and underlies that sandstone unit in which the other two wells are installed. The closest of these wells is located approximately 0.25 miles to the west of the Site. The other two wells are located approximately 0.37 and 0.41 miles to the southeast and east, respectively. Based on available information, the shallow groundwater at the silty clay, shale interface, encountered at the Site, is not used as a potable water source. Due to the thick and confining nature of the shale unit, contamination of lower aquifers from on-Site sources is unlikely.

Groundwater Contaminant Unit #3	Maximum Concentration (µg/l)	MCL (µg/l)
Cadmium	12	5
trans- 1,2 Dichloroethene	110	100
cis -1,2 Dichloroethene	12,000	70
Tetrachloroethene	24,000	5
Trichloroethene	1000	5
Vinyl Chloride	650	2

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within existing area of contaminated groundwater[2] as defined by the monitoring locations designated at the time of this determination)?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the existing area of groundwater contamination[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the existing area of groundwater contamination[2]) - skip to #8 and enter NO status code, after providing an explanation.

____ If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

Summary and Assessment of Baseline and Delineation Investigation Activities (Hull and Associates, 2013)

Groundwater analytical data at the Site indicate that elevated concentrations of chlorinated compounds are located within the northwest portion of the Site, west of SWMU 14. The highest concentrations of chlorinated compounds were detected in monitoring well HMW-3; a reduction in both the number of detected chlorinated compounds as well as the concentration levels was observed in monitoring well HMW- 12 upgradient and north of HMW-3. Monitoring well HMW-13 includes a single detected concentration of a chlorinated compound (i.e., trichloroethene) that exceeds its respective tap water RSL, but is below its respective MCL and Non-Drinking WQS.

Chlorinated compounds in groundwater were not detected above applicable standards in any remaining monitoring wells at the Site. The highly impacted well, HMW-3, is located within the former ravine area; the monitoring well location is presented on Figure 6 which shows that groundwater in this area flows towards the former ravine.

Monitoring wells HMW-10 through HMW-13 to the south and southwest of HMW-3 were installed to further assess the elevated concentrations of chlorinated compounds observed in groundwater from HMW-3. As shown on Figure 8, chlorinated compounds were not detected above their respective applicable standards in monitoring wells HMW-10 and HMW-11, both of which are located southeast and southwest of HMW-3. See Figure 4 attached.

The origin of the chlorinated compounds may be from the adjacent site to the North, Bedford Anodizing, or from the site. Results show that the impacts in groundwater of chlorinated compounds have stabilized.

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[2] existing area of contaminated groundwater is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of contamination that can and will be sampled/tested in the future to physically verify that all contaminated groundwater remains within this area, and that the further migration of contaminated groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Semi Volatile Organic Compounds (SVOCs) and metals above screening levels are present in wells HMW-4 and HMW-13 and HWW-3, and aren't seen above screening levels in the other site wells to the south, east and southwest. Similar SVOCs are seen in soils at the site. Given that these contaminants are not highly mobile in groundwater and are located in wells upgradient of the local groundwater low in the filled in ravine area, groundwater impacts of the SVOCs and metals have stabilized.

4. Does contaminated groundwater **discharge** into **surface water** bodies?

X If yes - continue after identifying potentially affected surface water bodies.

___ If no - skip to #7 (and enter a YE status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater contamination does not enter surface water bodies.

___ If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

There are 5 surface water sample locations sampled in the unnamed tributary to Tinkers Creek. Metals and SVOCs are detected in SW-1 through SW-3 surface water samples. Chlorinated compounds are detected in SW-2 through SW-5 surface water in locations. Clearly groundwater impacts appear in surface water. The results from the 2012/2013 samples are summarized below.

Surface Water	Maximum Concentration (µg/l)	* Human Health Non-Drinking Water WQS (µg/l)
Arsenic	3.1	580
Barium	230	160,000
Cadmium	5.6	730
Chromium	11	14,000
Selenium	3.2	3,100
Anthracene	0.035	630
Flouranthene	0.13	9.5
Pyrene	0.086	15
1,2 Dichloroethane	8.9	230
cis -1,2 Dichloroethene	220	36,000
Vinyl Chloride	**38**	28

*Water quality criteria for the Lake Erie drainage basin, Aquatic Life and Human Health Tier 1 Criteria, Tier II Values and Screening Values contained in and developed pursuant to Chapters 3745-1 and 3745-2 of the Ohio Administrative Code (OAC). 10/20/09

5. Is the **discharge** of contaminated groundwater into surface water likely to be **insignificant** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater level, and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations?

___ If yes - skip to #7 (and enter YE status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

X If no - (the discharge of contaminated groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater levels, the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

___ If unknown - enter IN status code in #8.

Rationale and Reference(s):

Surface Water SW	Maximum Concentration (µg/l)	Groundwater MCLs MCL (µg/l)
Arsenic	3.1	10
Barium	230	2000
Cadmium	**5.6**	5
Chromium	11	100
Selenium	3.2	50
Anthracene	0.035	630
Flouranthene	0.13	9.5
Pyrene	0.086	15

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of contaminated groundwater into surface water be shown to be **currently acceptable** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

X If yes - continue after either: 1) identifying the Final Remedy decision
___ incorporating these conditions, or other site-specific criteria (developed for the protection of the site=s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment levels, as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

___ If no - (the discharge of contaminated groundwater can not be shown to be **currently acceptable**) - skip to #8 and enter NO status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

___ If unknown - skip to 8 and enter AIN@ status code.

Rationale and Reference(s):

Surface Water SW	Maximum Concentration (µg/l)	*Ecological Criteria Outside the Mixing Zone Average OMZA SW (µg/l)
Arsenic	3.1	150
Barium	**230**	220
Cadmium	**5.6**	2.5

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

1,2 Dichloroethane	**8.9**	5
cis -1,2 Dichloroethene	**220**	70
Vinyl Chloride	**38**	2

Surface water samples from this area were collected during annual sampling events completed from 2006 through 2009. Samples were collected from the two outfalls located on the property; the Street Interceptor and the outfall located in the northwest portion of the Site after the tributary daylights. Analytical data collected from the two locations indicates that chlorinated compounds were detected in surface water samples collected beneath the outfall in the northwest portion of the Site. In general, the chlorinated compounds analytical results from the surface water samples collected during the baseline and delineation sampling activities are generally consistent with the analytical results observed during the annual sampling events conducted from 2006 through 2009. This indicates that the analytical results are stabilized over time and not increasing.

There are no surface water results 100 times the groundwater values as indicated from the table above.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the existing area of contaminated groundwater?

X — If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the existing area of groundwater contamination.

___ If no - enter NO status code in #8.

___ If unknown - enter IN status code in #8.

Rationale and Reference(s):

It is anticipated that long term monitoring of the groundwater will be part of the Corrective Measure Plan to include HMW-4, HMW-3, HMW-10, HMW-11, HMW-12 and HMW-13.

Chromium	11	86
Selenium	3.2	55
Anthracene	**0.035**	0.02
Flouranthene	0.13	0.8
Pyrene	0.086	4.6
1,2 Dichloroethane	8.9	2000
cis -1,2 Dichloroethene	220	970
Vinyl Chloride	38	930

*Water quality criteria for the Lake Erie drainage basin, Aquatic Life and Human Health Tier 1 Criteria, Tier II Values and Screening Values contained in and developed pursuant to Chapters 3745-1 and 3745-2 of the Ohio Administrative Code (OAC). 10/20/09

The surface water samples show exceedances for Barium, Cadmium and Anthracene. Sediment samples show exceedances of ecological levels, Region 5 Sediment ESLs, for Metals and SVOcs, but is not seen for chlorinated volatile organics.

Although these impacts are present, the unnamed tributary to Tinker's Creek aquatic life habitat designation is identified as a Limited Resource Water (LRW) as contained in Table 26-2 of the Ohio Administrative Code (OAC) 3745-1-26. In accordance with OAC 3745-1-07(B)(1)(g), LRWs are defined as "waters that have been the subject of a use attainability analysis and have been found to lack the potential for any resemblance of any other aquatic life habitat. The use attainability analysis must demonstrate that the extant fauna is substantially degraded and that the potential for recovery of the fauna to the level characteristic of any other aquatic life habitat is realistically precluded due to natural background conditions or irretrievable human-induced conditions."

As such, attainment of water quality standards with respect to aquatic life within this tributary is not expected based upon its location and corresponding water quality designation. Also, exceedances of applicable surface water ecological screening criteria were not observed in the 24-hour composite samples collected at the Site indicating that COCs in surface water are not leaving the Site in excess of their respective screening levels.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Ferro Corporation facility, EPA ID # 004 161 410, located in Walton Hills, OH . Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed

___ IN - More information is needed to make a determination.

Completed by	(signature)		Date 9/24/14
	(print)	Christopher J. Black	
	(title)	Environmental Scientist	
Supervisor	(signature)		Date 9/24/14
	(print)	Tammy Moore	
	(title)	Chief, Corrective Action Section 2	
	(EPA Region or State)	Region 5	

Locations where References may be found:
RCRA File Room, 7th Floor
77 W. Jackson
U.S. EPA Region 5
Chicago, IL 60604

Contact telephone and e-mail numbers

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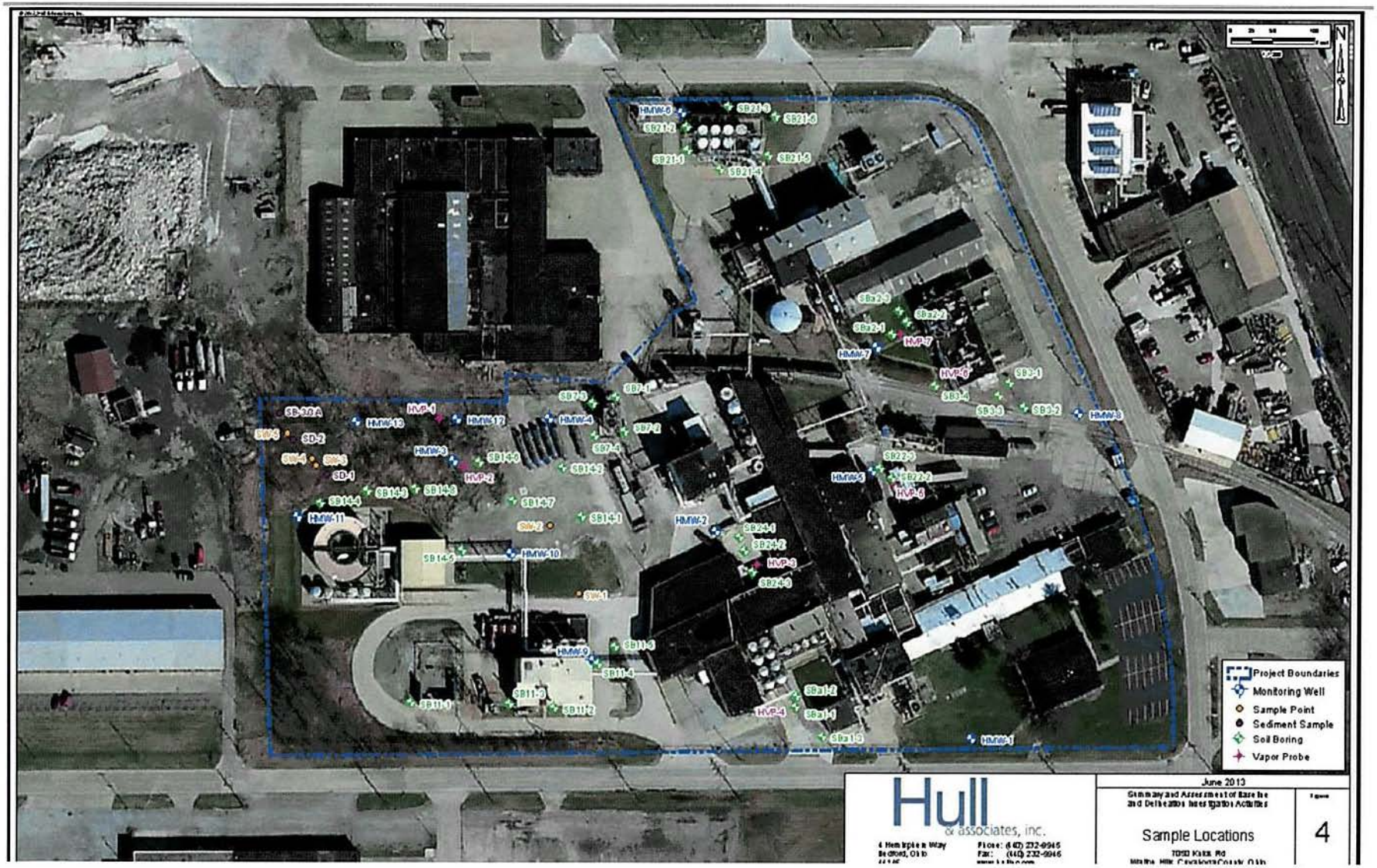
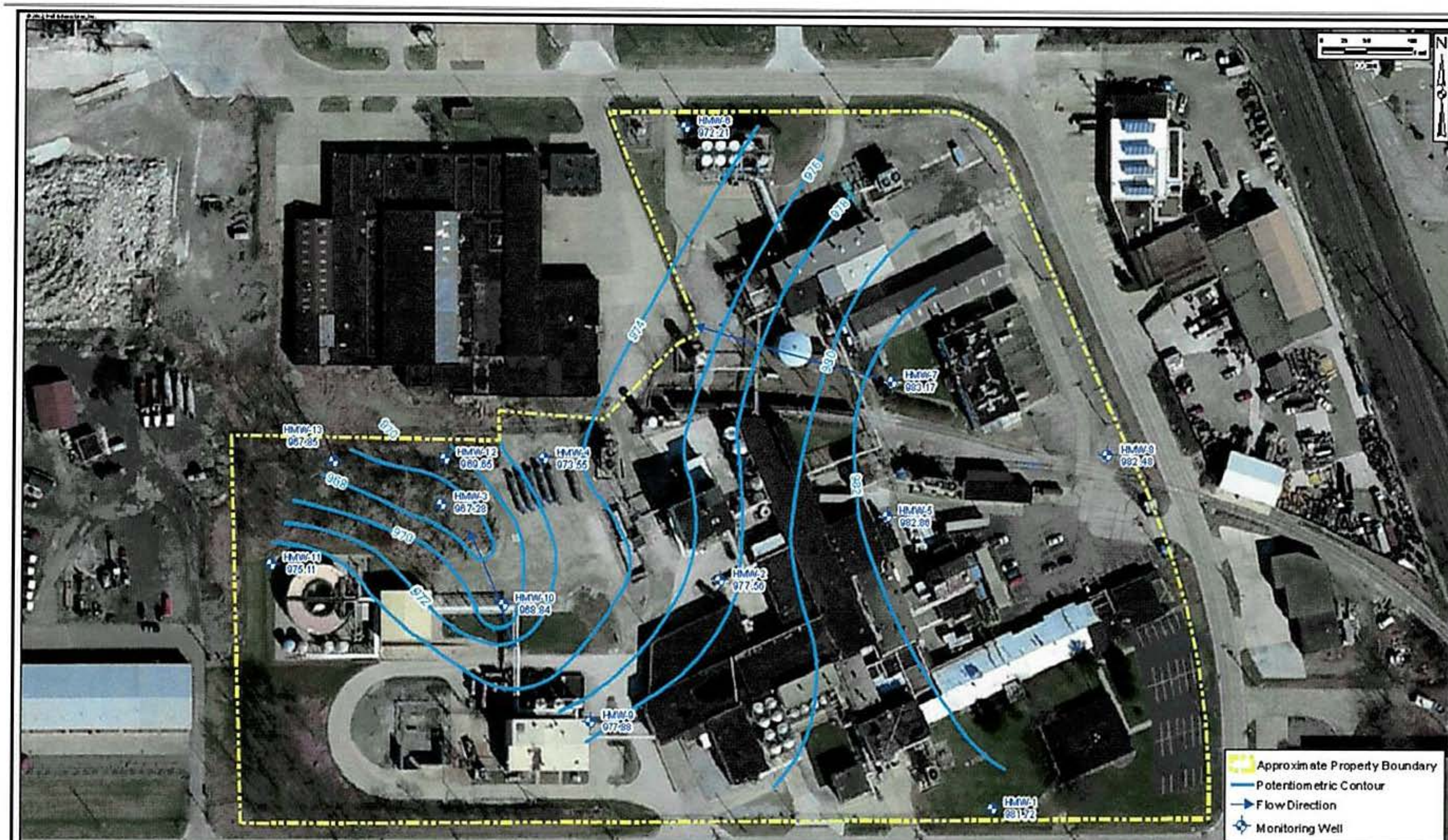

Project Boundaries
Monitoring Well
Sample Point
Sediment Sample
Soil Boring
Vapor Probe
Hull & associates, inc.
June 2013
Sample Locations
4



Hull & associates, inc.

June 2013

Potentiometric Surface Map
May 9, 2013

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DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final

2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Ferro Corporation
Facility Address: 7050 Krick Road, Walton Hills, Ohio
Facility EPA ID #: OHD 004 161 410

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.
___ If no - re-evaluate existing data, or
___ if data are not available skip to #6 and enter"IN" (more information needed) status code.
___

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Site Background:

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Prior to Ferro acquiring the Site, the eastern portion of the Site was owned by Chase Dryer, a company who manufactured paint drying additives. The western portion of the Site was formerly owned by Bedford Anodizing. Planned future use of the Site is for commercial/industrial land use. The surrounding land use consists of commercial/industrial, and vacant properties.

The US EPA completed a PA/VSI for the facility on January 24, 1992, which included identification of ten Solid Waste management Areas (SWMUs) and no Areas of Concern (AOCs). A secondary US EPA site visit on August 11, 2010 identified five additional SWMUs. Utilizing the PA/VSI and secondary US EPA site visit as a starting point, Ferro completed a CCR for the Site that identified nine SWMUs and two AOCs, in addition to the SWMUs previously identified by the US EPA. Based on information included in the US EPA PA/VSI, the US EPA secondary Site visit and the information obtained during the completion of the CCR, it was determined that a total of 8 SWMUs and two AOCs required further investigation. The SWMUs investigated are #s 3,7,11,14,15,21,22 and 24; the AOCs are #s 1 and 2. A Summary and Assessment of Baseline and Delineation Investigation Activities was conducted to investigate the nature and extent of the contamination in the 2012/2013 time frame.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Metals and some chlorinated organics exceed Maximum Contaminant Levels (MCLs).
Air (indoors) [2]		X		Volatile organic compounds (VOCs) detected in soil gas do not exceed *sub-slab soil gas screening criteria. * EPA Vapor Intrusion Screening Calculator Values
Surface Soil (e.g., <2 ft)	X			Benzo(a)pyrene, Ethylbenzene and Xylene exceed RSLs in surface soil.
Subsurf. Soil (e.g., >2 ft)	X			Arsenic, chromium and 1,2,4-trimethlybenze exceed RSLs in soil.
Sediment	X			Cadmium and SVOCs exceeded the industrial soil screening criteria.
Surface Water	X			Vinyl Chloride was above risk screening levels
Air (outdoors)	X			Soil gas levels of VOCs exceeded the industrial ambient air screening criteria.

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

If unknown (for any media) - skip to #6 and enter "IN" status code.

References: *Current Conditions Report* (Hull and Associates, 2011)
Summary and Assessment of Baseline and Delineation Investigation Activities (Hull and Associates, 2013)

Groundwater:

Geology/Hydrogeology

Review of soil boring logs and monitoring wells completed at the Site indicates that the majority of the Site is covered by three distinct stratigraphic units. Unit #1 is fill material that ranges from 0 feet to 20 feet with an average thickness of 12.0 feet (Urban Land). Unit #2 is a brown silty clay loam that ranges from 1.0 feet to 15.5 feet with an average thickness of 7.0 feet. Unit #3 consists of gray weathered shale encountered at depths ranging from 12 to 25 feet bgs.

Groundwater elevations recorded following the well installations indicate that the major water bearing unit at the Site is located at the silty clay, shale interface and that the groundwater encountered exhibited characteristics of confined conditions. Based on the available information (i.e., water levels, boring logs, field observations) it appears that groundwater is in communication with the unnamed tributary to Tinkers Creek.

Groundwater Use

The City of Cleveland currently provides potable water to the Site. No evidence of use of groundwater as a potable water source was evident at the Site. In the surrounding area, there are twenty-six wells identified by ODNR that are likely private water supply wells. According to information provided by the Cuyahoga County Auditor, twenty three of the well locations are connected to a municipal water supply. The three properties that are not connected to the municipal water supply, and likely use their well as a source of potable water, are installed to depths ranging between 100 and 178 feet bgs. Two of the wells are installed into the sandstone unit that directly underlies the shale unit that was encountered at the Site. The sandstone unit was encountered 97 and 98 feet bgs. The third potable well that appears to be in use is installed into a shale aquifer, which was encountered 162 feet bgs and underlies that sandstone unit in which the other two wells are installed. The closest of these wells is located approximately 0.25 miles to the west of the Site. The other two wells are located approximately 0.37 and 0.41 miles to the southeast and east, respectively. Based on available information, the shallow groundwater at the silty clay, shale interface, encountered at the Site, is not used as a potable water source. Due to the thick and confining nature of the shale unit, contamination of lower aquifers from on-Site sources is unlikely.

There were 13 monitoring wells on-site for this investigation drilled to a depth of 15 - 20 feet below ground surface (bgs) and using a 10 foot well screen. Five monitoring wells saw results above screening

levels, HMW-4, HWW-12, HMW-13, HMW-11 and HMW-3. Monitoring well HMW-3 saw the highest impacts on site, including the highest elevation of chlorinated solvents.

Groundwater Contaminant Unit #3	Maximum Concentration/Monitoring Well (µg/l)	MCL (µg/l)
Cadmium	**12 (HMW-4)**	5
trans- 1,2 Dichloroethene	**110 (HMW-3)**	100
cis -1,2 Dichloroethene	**12,000 (HMW-3)**	70
Tetrachloroethene	**24,000 (HMW-3)**	5
Trichloroethene	**1000 (HMW-3)**	5
Vinyl Chloride	**650 (HMW-3)**	2

Surface/Subsurface Soil:

Thirty eight soil samples were collected around the site in SWMUs and AOCs where potential releases to soil could have occurred. See figure 4 attached.

Soil Contaminant	Maximum Concentration/ Depth (mg/kg)	Industrial Soil RSL (mg/kg)
Arsenic **(Subsurface)**	**74 (2.5-4.5 ft.) SB11-4**	1.6
Chromium **(Subsurface)**	**650 (2-4 ft.) SB14-2**	450
Benzo(a)pyrene **(Surface)**	**1.2 (0.5-2.5 ft.) SB24-1**	0.21
1,2,4-Trimethylbenzene **(Subsurface)**	**52 (10-12 ft.) SB24-3**	26
Ethylbenzene **(Surface)**	**56 (1-3 ft.) SB22-3**	27

Xylene **(Surface)**	**350** **(1-3 ft.) SB22-3**	270

Surface Water/Sediment:

The surrounding area displays a moderate slope to the west towards Tinkers Creek. The site lies within the Cuyahoga River watershed and is approximately four miles east of the Cuyahoga River. The nearest surface water body is a culverted stream that runs northwest through the central portion of the Site. The stream was culverted in the early to mid-1990s. The stream becomes exposed at the surface in the northwest corner of the Site, prior to discharge into Tinkers Creek, approximately 0.75 miles north of the Site.

Four sediment (SD-1,SD-2, SD-3 and SD-3A) samples and five surface water grab samples (SW-1 through SW-5) and two 24 hour composite surface water samples were collected in the unnamed tributary to Tinkers Creek between October, 2012 and May, 2013. Sampling locations are illustrated on Figure 4-attached.

Surface Water Unnamed Tributary to Tinker Creek	Maximum Concentration (µg/l)	* Human Health Non-Drinking Water WQS (µg/l)
Arsenic	3.1	580
Barium	230	160,000
Cadmium	5.6	730
Chromium	11	14,000
Selenium	3.2	3,100
Anthracene	0.035	630
Flouranthene	0.13	9.5
Pyrene	0.086	15
1,2 Dichloroethane	8.9	230
cis -1,2 Dichloroethene	220	36,000
Vinyl Chloride	**38**	28

*Water quality criteria for the Lake Erie drainage basin, Aquatic Life and Human Health Tier 1 Criteria, Tier II Values and Screening Values contained in and developed pursuant to Chapters 3745-1 and 3745-2 of the Ohio Administrative Code (OAC). 10/20/09

Sediment Unnamed Tributary to Tinker Creek	Maximum Concentration (mg/kg)	Industrial Soil RSL (mg/kg)
Benzo(a)anthracene	**12**	2.1
Benzo(a)pyrene	**10**	0.21
Benzo(b)fluoranthene	**13**	2.1
Dibenz(A,H)anthracene	**1.8**	0.21
Ideno (1,2,3-CD) Pyrene	**6.5**	2.1
Cadmium	**88**	80

Soil Gas:

Seven soil vapor probes were installed to a depth of approximately 5 feet bgs and was constructed of a stainless steel probe with tubing and 3/8 inch diameter stainless steel screens. Each vapor monitoring probe was completed with a flush mount surface protector to secure the probe in the ground. However, water was detected in all vapor points, except HVP-2. One, 6-liter Summa canister was permitted to fill at a rate of approximately 4 ml/min for a 24-hour sampling interval at HPV-2. The Summa canister sample was submitted for chemical analysis and analyzed VOCs in accordance with US EPA method TO-15.

Soil Gas Results	Maximum Concentration ($\mu g/m^3$)	Industrial Air RSL ($\mu g/m^3$) HVP-2	Industrial Air Sub-slab Screening Values ($\mu g/m^3$)
Ethylbenzene	**8.7**	4.9	49
Trichloroethene	**3.5**	3	30
Benzene	**4.5**	1.6	16

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Industrial Workers	Day-Care	Construction	Trespassers/ Visitors	Recreation	Food[3]
Groundwater	No	No	No	**Yes**	No	No	No
Air (indoors)	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	**Yes**	No	**Yes**	**Yes**	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	**Yes**	No	No	No
Surface Water	No	**Yes**	No	**No**	**Yes**	No	No
Sediment	No	**Yes**	No	**No**	**Yes**	No	No
Air (outdoors)	No	**Yes**	No	No	Yes	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

If yes continue after **X** ___ (pathways are complete for any "Contaminated" Media - Human Receptor combination) - providing supporting explanation.

If unknown "IN" status ___ (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter code.

Summary and Assessment of Baseline and Delineation Investigation Activities (Hull and Associates, 2013)

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[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Rationale:

Groundwater - The potential for exposure to groundwater is low because it is not used on-site for potable or industrial purposes. In addition, residential users have not been identified within a one-mile radius of the site and homes are on city water. However, due to the shallow depth of groundwater in some portions of the site, exposure may occur during construction/excavation activities. Potentially complete exposure pathways for a construction/excavation worker may include: incidental ingestion of and dermal contact with groundwater and inhalation of chemicals through volatilization.

Surface Soil - The potential for exposure to contaminants in surface soils is present for on-site receptors in portions of the manufacturing facility. Potentially complete exposure pathways for industrial workers, construction workers and trespassers may include: incidental ingestion of and dermal contact with surface soil and inhalation of soil-derived particulates. Industrial workers and constructions workers may be exposed to contaminated surface soil, as indicated in the table above, near soil boring SB22-3 in SWMU22 and also near SB24-1 in SWMU 24.

Subsurface Soil - Subsurface soil contamination is found on-site, and exposure to subsurface soil is achieved during excavation and construction activities. Potentially complete exposure pathways for construction workers may include incidental ingestion of and dermal contact with subsurface soil and inhalation of soil-derived particulates and vapors.

Sediment - Five SVOCs and cadmium were detected in sediment samples in the unnamed tributary to Tinker Creek at concentrations exceeding the screening criteria. Industrial workers and trespassers can potentially contact sediment in the unnamed tributary to Tinker Creek. Potentially complete exposure pathways for industrial workers and trespassers may include: incidental ingestion of and dermal contact with sediment and inhalation of sediment particulates.

Surface Water- Surface water data collected from unnamed tributary to Tinker Creek shows vinyl chloride exceeding the applicable surface water criteria. Potentially complete exposure pathways for industrial (maintenance) workers and trespassers may include: incidental ingestion of and dermal contact with surface water and inhalation of surface water.

Indoor Air – Under current conditions, s oil gas data collected at HPV-2 exceeds Industrial Air RSLs, for ethlybenzene, trichloroethene, and benzene. However this sample point is the ravine fill area in the northwest portion of the site and 200 feet from the nearest building.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

__X__ If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

___ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

___ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

References:

Rationale:

Groundwater. Groundwater for potable purposes is not used at or in the near vicinity of the site. However, there is a potential that construction workers engaged in excavation activities may encounter the water table. To help mitigate theses exposures a health and safety policy and procedures are employed at the facility to protect against construction worker exposures. The health and safety policies and procedures ensure that appropriate measures are taken for personnel protection should such subsurface activity encounter impacted groundwater (e.g., PPE).

Surface Soil: The surface soil exposure in the manufacturing area is mitigated in areas covered by asphalt, concrete, or a building. VOCs and metals were detected in the subsurface soil at near soil boring SB22-3 in SWMU22 and also near SB24-1 in SWMU 24. These soil results are in a concrete or asphalt covered area and the exposure pathway is cut off due to concrete or asphalt above these areas.

Subsurface Soil - Subsurface soil contamination is found on-site, at SB11-4, SB14-2 and SB24-3 at depths between 2-12 feet below ground surface. The potentially complete exposure pathways for construction workers of incidental ingestion, dermal contact and inhalation is mitigated by the Health and safety policies and procedures employed at the facility to protect against unacceptable human exposures. Health and safety policies and procedures ensure that appropriate measures are taken for personnel protection should such subsurface activity encounter impacted soils or groundwater (e.g., PPE).

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[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

Sediment - Exposure pathways for sediment are present at the site in unnamed tributary to Tinker Creek. However, these screening levels are based on conservative exposure duration of 25 years with an exposure frequency of 250 days per year. The need for access to this area by a maintenance worker is four times a year for sampling. Also, the stream runs in a culvert through much of the site and daylights in the far northwest corner limiting the sediment exposure to that area. Therefore, the risk due to considerably reduced exposure frequency for a trespasser or maintenance worker is expected to be less significant at the unnamed tributary.

Surface Water - Industrial (maintenance) workers and trespassers can potentially contact surface water in the unnamed tributary to Tinker Creek. The unnamed tributary to Tinker Creek is not used as a drinking water source, but, the Ohio EPA Surface Water Criteria for a non-drinking water human receptor, was exceeded for vinyl chloride. The screening criterion at 28 ug/l for vinyl chloride represents the maximum ambient water concentration of a substance at which a lifetime of exposure from consuming fish from the water, and water-related recreation activities will result estimated excess cancer risk of 1 in 100, 000. Since, the unnamed tributary to Tinker's Creek aquatic life habitat designation is identified as a Limited Resource Water (LRW) as contained in Table 26-2 of the Ohio Administrative Code (OAC) 3745-1-26.and in accordance with OAC 3745-1-07(B)(1)(g), LRWs are defined as "waters that have been the subject of a use attainability analysis and have been found to lack the potential for any resemblance of any other aquatic life habitat ", it does not support fishing. Further, the maintenance worker is expected to be exposed to surface water only 4 times a year during sampling events. Therefore, the risk due to considerably reduced exposure frequency for a trespasser or maintenance worker is expected to be less significant at the unnamed tributary.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

___ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

___ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Ferro Corporation facility, EPA ID No. OHD 004 161 410, located in Walton Hills, Ohio under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

__ NO - "Current Human Exposures" are NOT "Under Control."

__ IN - More information is needed to make a determination.

Completed by	(signature)		Date	9/29/14
	(print)	Christopher J Black		
	(title)	Environmental Scientist		

Supervisor	(signature)		Date	9/29/14
	(print)	Tammy Moore		
	(title)	Section Chief		
	(EPA Region or State)	EPA Region 5		

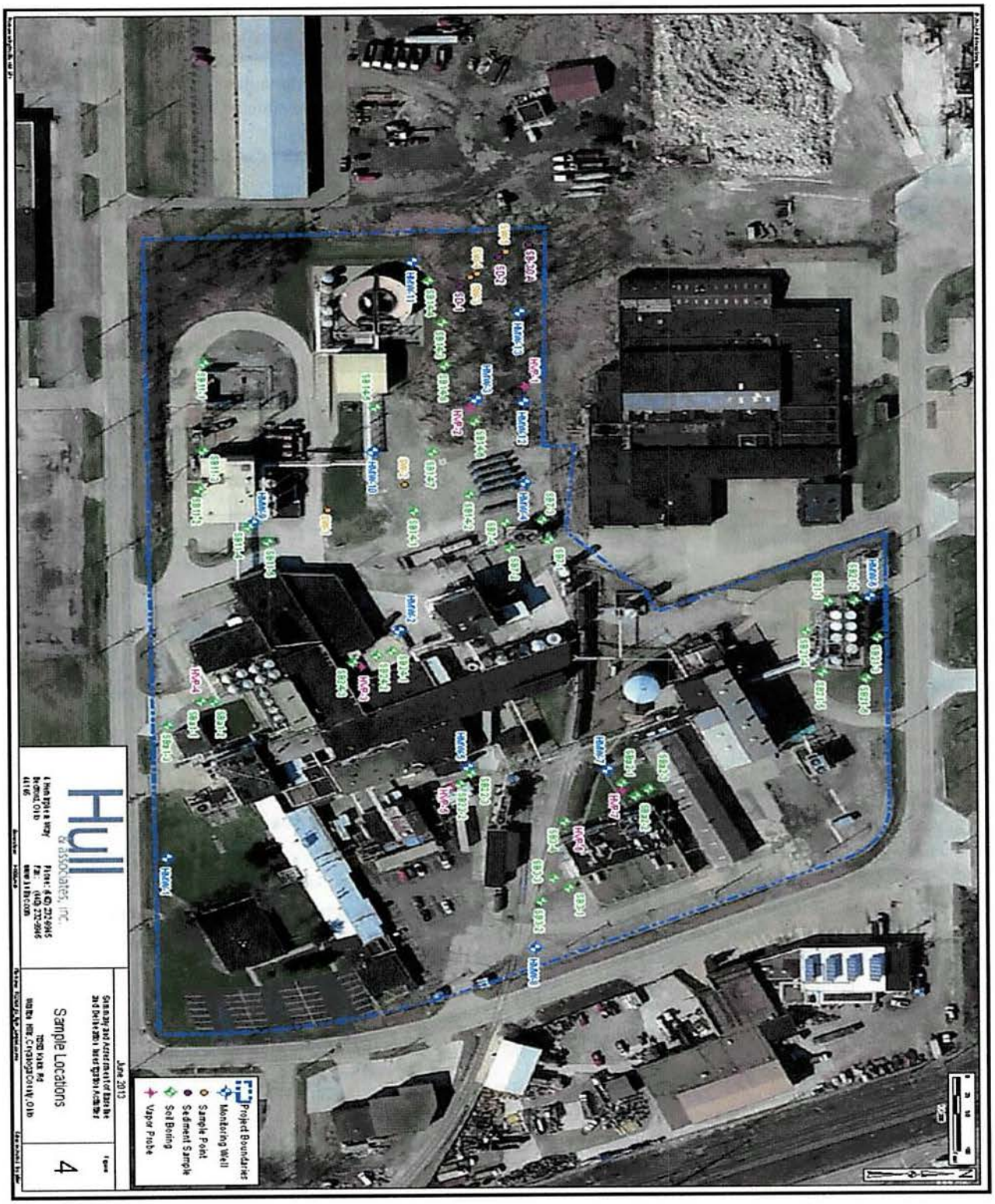
Locations where References may be found:
RCRA 7th Floor File Room, EPA Region 5 Office, 77 W. Jackson Blvd., Chicago, IL

Contact telephone and e-mail numbers

(name)	Christopher J Black
(phone #)	(312) 886-1451
(e-mail)	black.christopher@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 30 2011

REPLY TO THE ATTENTION OF:
LU-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Jason P. Perdion
Baker & Hostetler LLP
PNC Center
1900 East 9th Street, Suite 3200
Cleveland, Ohio 44114-3482

Re: Executed RCRA Section 3008(h) Performance–based Administrative Order on Consent
Ferro Corporation, 7050 Krick Road, Walton Hills, OH 44146
OHD 004 161 410
Docket Number **RCRA-05-2011-0018**

Dear Mr. Kehn:

I am enclosing a fully executed copy of the 3008(h) Administrative Order on Consent (AOC), docket number **RCRA-05-2011-0018** covering corrective action for past releases of hazardous contaminants at or from the subject facility. This performance-based AOC will provide the flexibility that you need to complete the work expeditiously. In addition, we expect that it will lead to better communication between our two organizations and the public. We look forward to working cooperatively with you and your staff on this project.

In accordance with Section V of the AOC, I am hereby designating Christopher Black as the EPA project manager for this project. If you have any questions, please contact him at (312) 886-1451 or black.christopher@epa.gov.

Sincerely yours,

Jose Cisneros, Chief
Remediation and Reuse Branch
Land and Chemicals Division

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

In the Matter of:

Ferro Corporation
7050 Krick Road
Walton Hills, Ohio 44146

U.S. EPA ID#: OHD004161410

Respondent.

ADMINISTRATIVE ORDER ON CONSENT

U.S. EPA Docket No. **RCRA-05-2011-0018**

Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6928(h)

I. JURISDICTION

1. The Administrator of the United States Environmental Protection Agency (U.S. EPA) is issuing this Administrative Order on Consent (Order) to Ferro Corporation (Ferro) under Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. § 6928(h). The Administrator has delegated the authority to issue orders under Section 3008(h) of RCRA to the Director, Land and Chemicals Division, U.S. EPA, Region 5.

2. Ferro currently manufactures organo-metallic compounds used as thermal stabilizers for polyvinyl chloride (PVC) plastics, organic and organo-metallic UV light stabilizers for plastics, epoxized vegetable oil used as a plastic stabilizer and organo-metallic paint driers at 7050 Krick Road, Walton Hills, Ohio (the "Facility"). Ferro has operated at the Facility since 1944.

3. Ferro agrees not to contest U.S. EPA's jurisdiction to issue this Order, to enforce its terms, or to impose sanctions for violations of the Order.

4. Ferro waives any right to request a hearing on this matter pursuant to Section 3008(b) of RCRA, 42 U.S.C § 6828(b), and 40 C.F.R. Part 24, and consents to the issuance of this Order without a hearing under Section 3008(b) of RCRA as a Consent Order issued pursuant to Section 3008(h) of RCRA.

II. DEFINITIONS

5. This Order incorporates the definitions in RCRA, 42 U.S.C. § 6903, and the regulations promulgated under RCRA unless otherwise specified.

III. PARTIES BOUND

6. This Order applies to and binds U.S. EPA, Ferro and its agents, successors, assignees, trustees, receivers, and all persons acting for or on behalf of Ferro. Ferro will be responsible for and liable for any violations of this Order, regardless of Ferro's use of employees, agents, contractors, or consultants to perform work required by this Order. To the extent that Ferro uses employees, agents, contractors or consultants to perform work required by this Order, Ferro shall inform such persons of the contents of this Order.

7. No change in ownership or corporate or partnership status relating to the Facility will alter Ferro's obligations under this Order. Any conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, will not affect Ferro's obligations under this Order. Ferro will give written notice of this Order to any successor in interest prior to transferring ownership or operation of the Facility or a portion thereof and will notify U.S. EPA in writing within fourteen (14) days of the transfer. This written notice will describe how Ferro has assured that, despite the transfer, all institutional controls required now or in the future for the Facility will be implemented and maintained. This Paragraph will not apply if U.S. EPA and Ferro agree that this Order has terminated as to the Facility or any relevant portion of the Facility.

IV. DETERMINATIONS

8. After consideration of the Administrative Record, the Division Director, Land and Chemicals Division, U.S. EPA, Region 5 has made the following conclusions of law and determinations:

a. Ferro is a "person" within the meaning of Section 1004(15) of RCRA.

b. Ferro is the owner or operator of a facility that has operated under interim status subject to Section 3005(e) of RCRA.

c. Certain wastes and constituents found at the Facility are hazardous wastes and/or hazardous constituents pursuant to Sections 1004(5) and 3001 of RCRA, and 40 C.F.R. Part 261.

d. There is or has been a release of hazardous wastes or hazardous constituents into the environment from the Facility.

e. The actions required by this Order are necessary in order to protect human health or the environment.

f. U.S. EPA has determined, in its sole discretion, that Ferro is a responsible entity with sufficient technical ability and resources to proceed on an expedited basis under an Order on Consent for the work described herein.

V. PROJECT MANAGER

9. U.S. EPA and Ferro must each designate a Project Manager and notify each other in writing of the Project Manager selected within fourteen (14) days of the effective date of this Order. To the extent practicable, all communications between U.S. EPA and Ferro, and all documents, reports, approvals, and other correspondence concerning the activities undertaken pursuant to this Agreement, shall be directed through the Project Managers. Each Project Manager will be responsible for overseeing the implementation of this Project. The parties must provide prompt written notice whenever they change Project Managers.

VI. WORK TO BE PERFORMED

10. Pursuant to Section 3008(h) of RCRA, Ferro agrees to and is hereby ordered to perform the actions specified in this section (Work to be Performed), in the manner and by the dates specified herein. Ferro represents that it has the technical and financial ability to carry out an investigation and corrective action at the Facility. Ferro must perform the work undertaken pursuant to this Order in compliance with RCRA and other applicable federal and state laws and their implementing regulations, and consistent with all relevant U.S. EPA guidance documents as appropriate to the Facility. This guidance includes, but is not limited to, the Documentation of Environmental Indicator Determination Guidance, Region 5 Guide to Performance-Based Corrective Action, OEPA Closure Plan Review Guidance for RCRA Facilities, October 2009, U.S. EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, March 2009, and relevant portions of the Model Scopes of Work for RCRA Corrective Action and various U.S. EPA risk assessment guidance.

11. Ferro will complete activities necessary to identify and define the nature and extent of releases of hazardous waste and/or hazardous constituents at or from the Facility. This includes:

a. Historical Data/Facility Condition. Prior to the date of this Order, a Final Preliminary Assessment/Visual Site Inspection Report (the "Report") dated January 24, 1992, was issued by U.S. EPA. The Report identified 10 Solid Waste Management Units (SWMUs) and no Areas of Concern (AOC) of hazardous waste and hazardous constituents at the Facility. A subsequent site visit by U.S. EPA on August 11, 2010 assessed the current SWMU status and identified 5 new SWMUs. By November 29, 2011, Ferro shall provide to U.S. EPA copies of all other reports available to Ferro that provide information on current and historic site conditions, including SWMUs and AOCs, and the results of any prior Facility investigation activities.

b. Current Conditions Report. Ferro shall provide to U.S. EPA, by January 28, 2012, a brief Current Conditions Report that includes any recent sampling data from the Facility and a summary of the historic operations and physical setting of the Facility. The Current Conditions Report will describe, at a minimum, conditions at all locations specified in the "Report" for the Facility and any other past or present locations at the Facility for which Ferro knows of past treatment, storage, or disposal of hazardous waste or hazardous constituents.

c. Environmental Indicator Reporting. Ferro will perform an investigation to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and the environment and provide a report ("Environmental Indicators Report") to U.S. EPA. The report must also describe the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Facility which do not pose an unacceptable risk to human health and the environment, and provide the basis for those conclusions, including an evaluation of the risks. Ferro may prepare and submit the report in phases to provide timely support for the demonstrations described in Paragraph 13., below, and for the determinations and proposal described in Paragraph 15., below. U.S. EPA may require Ferro to perform additional investigative measures if U.S. EPA concludes that such measures are required for a full assessment of the conditions at the Facility. The Environmental Indicator Report shall be submitted on or before June 30, 2013.

12. Ferro may proceed with interim actions to limit site investigation or risk assessment activities to complete the work as defined in Paragraphs 13. through 15., below. However, Ferro must notify the EPA Project Manager of its intent to initiate any interim corrective measures, and request approval at least 14 calendar days prior to beginning the construction work. The EPA Project Manager will determine what public engagement activities (if any) are appropriate prior to granting his/her approval. The EPA Project Manager shall approve, approve with modifications or deny the proposed interim corrective measures within 10 days of receiving notification. If the EPA Project Manager fails to respond to the notification within the 10 day period, Ferro may proceed to initiate the interim corrective measures.

13. Ferro will demonstrate by June 30, 2013, through submitting an Environmental Indicators Report and by performing any other necessary activities, consistent with this Section, that:

a. All current human exposures to contamination at or from the Facility are under control. That is, significant or unacceptable exposures do not exist for all media known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above risk-based levels, for which there are complete pathways between contamination and human receptors.

b. Migration of contaminated groundwater at or from the Facility is stabilized. That is, the migration of all groundwater known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above acceptable levels is stabilized to remain within any existing areas of contamination as defined by monitoring locations designated at the time of the demonstration. In addition, any discharge of groundwater to surface water is either insignificant or shown to be currently acceptable according to an appropriate interim assessment. Ferro will collect monitoring and measurement data in the future as necessary to verify that migration of any contaminated groundwater is stabilized.

14. To prepare for and provide the demonstrations required by Paragraph 13., above, Ferro will:

a. Determine appropriate risk screening criteria under current use scenarios and provide the basis and justification for the use of these criteria.

b. Determine any current unacceptable risks to human health and the environment and describe why other identified risks are acceptable.

c. Control any unacceptable current human exposures that are identified. This may include performing any corrective actions or other response measures ("Corrective Measures") necessary to control current human exposures to contamination to within acceptable risk levels.

d. Stabilize the migration of contaminated groundwater. This may include implementing any Corrective Measures necessary to stabilize the migration of contaminated groundwater.

e. Conduct groundwater monitoring to identify the migration of contaminated groundwater and to confirm that any contaminated groundwater remains within the original area of contamination.

f. Prepare a report, either prior to or as part of the Environmental Indicators Report, that describes and justifies any interim actions performed pursuant to Paragraph 12., above, to meet the requirements of this Section, including sampling documentation, construction completion documentation and/or confirmatory sampling results.

15. Ferro will propose to U.S. EPA by June 30, 2014 final Corrective Measures necessary to protect human health and the environment from all current and future unacceptable risks due to releases of hazardous waste or hazardous constituents at or from the Facility (the "Final Corrective Measures Proposal"). The proposal will describe all Corrective Measures implemented at the Facility since the effective date of this Order. It will also include a description of all other Corrective Measures evaluated by Ferro, a detailed explanation of why the proposed final Corrective Measures are preferred by Ferro, and cost estimates for all Corrective Measures evaluated. The proposal will also include a detailed schedule for construction and implementation of the final Corrective Measures, and for submittal of a Final Remedy Construction Completion Report. This schedule will provide for initiation of as much of the initial construction work as practicable within one year after U.S. EPA selects the final Corrective Measures and completion of all final Corrective Measures within a reasonable period of time such that human health and the environment are protected.

16. As part of the development of its proposal, Ferro will propose appropriate risk screening criteria, cleanup objectives, and points of compliance under current and reasonably expected future land use scenarios and provide the basis and justification for these decisions. For purposes of demonstrating that the groundwater Environmental Indicator has been met and for any final Corrective Measures that relate to groundwater at the Facility an Ohio Urban Setting Designation (USD) applicable or granted to the Facility by the Director of the Ohio EPA may be used to demonstrate that all potable use exposure pathways are incomplete and any

unrestricted potable groundwater use standards may not apply.

17. U.S. EPA may request supplemental information from Ferro if it determines that the proposal and supporting information do not provide an adequate basis for selection of final Corrective Measures that will protect human health and the environment from the release of hazardous waste and hazardous constituents at or from the Facility. Ferro will provide such supplemental information in a timely manner as reasonably directed in writing by U.S. EPA.

18. U.S. EPA will provide the public with an opportunity to review and comment on its proposed final Corrective Measures, including a detailed description and justification for the proposal (the "Statement of Basis"). Following the public comment period, U.S. EPA will select the final Corrective Measures to be implemented by Ferro, and provide notification of its decision and rationale in a "Final Decision and Response to Comments" (the "Final Decision").

19. Upon notice by U.S. EPA, Ferro will implement the final Corrective Measures selected in U.S. EPA's Final Decision in accordance with the schedule therein, subject to Section XI — Dispute Resolution.

20. Reporting and other requirements:

a. Ferro will establish a publicly accessible repository for information regarding site activities, and shall develop and submit by December 31, 2011, a plan for U.S. EPA review and approval for public outreach and involvement activities.

b. Ferro will provide quarterly progress reports to U.S. EPA by the fifteenth day of the month after the end of each quarter, provided, however, that the first such quarterly report shall be due before October 15, 2011. The report must list work performed to date, data collected, problems encountered, project schedule, and percent project completed. The quarterly progress reports may be submitted electronically.

c. The parties will communicate frequently and in good faith to assure successful completion of the requirements of this Order, and will meet on at least a semi-annual basis to discuss the work proposed and performed under this Order.

d. Ferro will provide a Final Remedy Construction Completion Report documenting all work Ferro has performed pursuant to the schedule in U.S. EPA's Final Decision selecting the final Corrective Measures.

e. If ongoing monitoring or operation and maintenance is required after construction of the selected final Corrective Measures. Ferro will include an operations and maintenance plan in the Final Remedy Construction Completion Report. Ferro will revise and resubmit the Report in response to U.S. EPA's written comments, if any, by the due dates specified by U.S. EPA. Upon U.S. EPA's written approval, Ferro will implement the approved operation and maintenance plan in accordance with the schedule and provisions contained

therein.

f. Any risk assessments conducted by Ferro must estimate human health and ecological risk under reasonable maximum exposure for both current and reasonably expected future land use scenarios. Risk assessments will be conducted in accordance with the Risk Assessment Guidance for Superfund (RAGS) or other appropriate U.S. EPA guidance. Ferro will utilize appropriate, conservative screening values when screening to determine whether further investigation is required. Appropriate screening values include those derived from Federal Maximum Contaminant Levels (MCL), U.S. EPA, Region 9 Preliminary Remediation Goals (PRG), U.S. EPA, Regional Screening Levels (RSL), U.S. EPA, Region 5 Ecological Screening Levels (ESL formerly known as EDQL), U.S. EPA, Region 5 Risk Based Screening Levels (RBSL), RAGS, or other appropriate U.S. EPA guidance.

g. All sampling and analysis conducted under this Order will be performed in accordance with the Region 5 RCRA Quality Assurance Project Plan (QAPP) Policy (April 1998) as appropriate for the Facility, and be sufficient to identify and characterize the nature and extent of all releases as required by this Order. U.S. EPA reserves the right to audit laboratories selected by Ferro or to require Ferro to purchase and have analyzed any Performance Evaluation (PE) samples selected by U.S. EPA which are compounds of concern. Ferro will notify U.S. EPA in writing at least fourteen (14) days before beginning each separate phase of field work performed under this Order. At the request of U.S. EPA, Ferro will provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples collected by Ferro pursuant to this Order.

21. Project Managers can agree in writing to extend, for ninety (90) days or less, any deadline in this Section VI. However, extensions of greater than ninety (90) days require obtaining approval from the Chief of the Remediation and Reuse Branch, Land and Chemicals Division.

VII. ACCESS

22. Upon reasonable notice, and at reasonable times, U.S. EPA, its contractors, employees, and any designated U.S. EPA representatives may enter and freely move about the Facility pursuant to this Order, respecting Ferro's reasonable and appropriate safety and security procedures to, among other things: interview Facility personnel and contractors in the presence of a Ferro representative and, at Ferro's discretion, its legal counsel; review Ferro's progress in carrying out the terms of this Order; conduct tests, sampling, or monitoring as U.S. EPA deems necessary; use a camera, sound recording, or other documentary equipment; and verify the reports and data Ferro submits to U.S. EPA. Ferro will permit such persons to inspect and copy all non-privileged records, files, photographs, and documents, including all sampling and monitoring data that pertain to work undertaken under this Order and that are within the possession or under the control of Ferro or its contractors or consultants. U.S. EPA will permit Ferro to take split samples during any sampling events conducted by U.S. EPA.

23. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Ferro will use best efforts to obtain access agreements necessary to complete work required by this Order from the present owner(s) of such property within thirty (30) days of the date that the need for access becomes known to Ferro. Any such access agreement will provide for access by U.S. EPA and its representatives. Ferro will submit a copy of any access agreement to U.S. EPA's Project Manager. In the event that agreements for access are not obtained within thirty (30) days, Ferro will notify U.S. EPA in writing within fourteen (14) days thereafter of both the efforts undertaken to obtain access and the failure to obtain access agreements. U.S. EPA may, at its discretion, assist Ferro in obtaining access to such properties.

24. Nothing in this Section limits or otherwise affects U.S. EPA's right of access and entry under applicable law, including RCRA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675.

VIII. COST ESTIMATES AND ASSURANCES OF FINANCIAL RESPONSIBILITY FOR COMPLETING THE WORK

25. Ferro shall submit to EPA detailed written estimates, in current dollars, of the cost of hiring a third party to conduct any investigation or interim action to be performed pursuant to Paragraph 12. and the demonstrations required by Paragraph 13., and any obligations related to any other work required to construct or implement any Final Corrective Measures and any long term monitoring or care under this Consent Order (the "Work"). The estimated cost of the Work shall account for the total costs of the work that they cover, as described in Section VI, including any necessary long term costs, such as operation and maintenance costs and monitoring costs. A third party is a party who is neither a parent nor a subsidiary of Ferro and does not share a common parent or subsidiary with Ferro. The cost estimates shall not incorporate any salvage value that may be realized from the sale of wastes, facility structures or equipment, land or other assets associated with the Facility.

a. Within thirty (30) days of submitting the Current Conditions Report as described in Paragraph 11.b., Ferro shall submit to EPA for review and approval an initial estimated cost of the Work to be performed which covers any interim action to be performed pursuant to Paragraph 12. and the demonstrations required by Paragraph 13. (the "Initial Cost Estimate"). The Initial Cost Estimate shall account for the costs of the work necessary to prepare to meet the requirements of Section VI, Paragraphs 11.b., 12, and 13 (including the costs of investigation, risk analyses, reports and the implementation of any reasonably foreseeable interim measures necessary to protect human health and the environment at the time the Initial Cost Estimate is submitted). The Initial Cost Estimate shall be updated annually to account for reasonably foreseeable costs of later phases of Work as decisions are made with respect to such future Work and reductions in future work that have been accomplished.

b. Within sixty (60) days after U.S. EPA issues the Final Decision as described in Paragraph 18., above, Ferro shall submit to U.S. EPA for approval detailed written estimates, in current dollars, of the estimated cost of all Work to be performed under Section VI of this Order including the final Corrective Measures. (the "Final Cost Estimate") The Final Cost Estimate must account for the costs of all remaining long term care work in addition to all remaining construction work.

c. Ferro shall annually adjust the Initial Cost Estimate or the Final Cost Estimate (collectively referred to as a "Cost Estimate"), as the case may be, for inflation and for changes in the scope of any Work to be performed, within sixty (60) days prior to the anniversary date of the establishment of the financial assurance instrument(s), until the Work required by this Order is completed. Ferro shall submit each annual Cost Estimate to U.S. EPA for review.

26. Assurances of Financial Responsibility for Completing the Work

a. Within seventy-five (75) days after U.S. EPA approves the Initial Cost Estimate (the "Financial Assurances Due Date"), Ferro shall establish and maintain financial assurance for the benefit of the U.S. EPA in the amount of the Initial Cost Estimate. Ferro may use one or more of the financial assurance forms described in Subparagraphs i. - vi., below. Any and all financial assurance instruments or mechanisms provided pursuant to Subparagraphs i. - v. below, shall be submitted to U.S. EPA for review and approval in draft form at least thirty (30) days before the date they are required to be finalized and shall be satisfactory in form and substance as determined by U.S. EPA. Ferro shall update the financial instrument or financial test demonstration to reflect changes to the Cost Estimate within 30 days of submittal of any revised Cost Estimate under Paragraph 25.a.-c. Notwithstanding the timeframes set forth in Paragraph 26.f., if EPA determines that a financial assurance instrument provided pursuant to this Section for the Initial Cost Estimate is inadequate solely due to an increase in the estimated cost of completing the Work, Ferro shall, at the time of the next annual updated Initial Cost Estimate, obtain and present to EPA for approval a proposal for a revised or alternative form of financial assurance listed in Paragraph 26. below that satisfies all requirements set forth or incorporated by reference in this Section.

i. A trust fund established for the benefit of EPA, administered by a trustee who has the authority to act as a trustee under Federal or State law and whose trust operations are regulated and examined by a Federal or State agency, and that is acceptable in all respects to the EPA. The trust agreement shall provide that the trustee shall make payments from the fund as the Director, Land and Chemicals Division, U.S. EPA, Region 5 shall direct in writing (1) to reimburse Ferro from the fund for expenditures made by Ferro for Work performed in accordance with this Consent Order, or (2) to pay any other person whom the Director, Land and Chemicals Division, U.S. EPA, Region 5 determines has performed or will perform the Work in accordance with this Consent Order. The trust agreement shall further provide that the trustee shall not

refund to the grantor any amounts from the fund unless and until EPA has advised the trustee that the Work under this Consent Order has been successfully completed.

ii. A surety bond unconditionally guaranteeing performance of the Work in accordance with this Consent Order, or guaranteeing payment at the direction of EPA into a standby trust fund that meets the requirements of the trust fund in Subparagraph 26.a.i. above. The surety company issuing the bond shall, at a minimum, be among those listed as acceptable sureties on Federal Bonds as set forth in Circular 570 of U.S. Department of the Treasury.

iii. An irrevocable letter of credit, payable at the direction of the Director, Land and Chemicals Division, U.S. EPA, Region 5, into a standby trust fund that meets the requirements of the trust fund in Subparagraph 26.a.i., above. The letter of credit shall be issued by a financial institution (i) that has the authority to issue letters of credit, and (ii) whose letter-of-credit operations are regulated and examined by a Federal or State agency.

iv. A policy of insurance that (i) provides EPA with rights as a beneficiary which are acceptable to EPA, and (ii) is issued by an insurance carrier that (a) has the authority to issue insurance policies in the applicable jurisdiction(s), and (b) whose insurance operations are regulated and examined by a Federal or State agency. The insurance policy shall be issued for a face amount at least equal to the current Cost Estimate of the Work to be performed under this Consent Order, except where costs not covered by the insurance policy are covered by another financial assurance instrument, as permitted in Paragraph 26.d. of this Section. The policy shall provide that the insurer shall make payments as the Director, Land and Chemicals Division, U.S. EPA, Region 5, shall direct in writing (i) to reimburse Ferro for expenditures made by Ferro for Work performed in accordance with this Consent Order, or (ii) to pay any other person whom the Director, Land and Chemicals Division, U.S. EPA, Region 5, determines has performed or will perform the Work in accordance with this Consent Order, up to an amount equal to the face amount of the policy. The policy shall also provide that it may not be canceled, terminated or non-renewed and the policy shall remain in full force and effect in the event that (i) Ferro is named as a debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or (ii) EPA notifies the insurer of Ferro's failure to perform, under Paragraph 28. of this section.

v. A corporate guarantee, executed in favor of the EPA by one or more of the following: (i) a direct or indirect parent company, or (ii) a company that has a substantial business relationship with Ferro (as defined in 40 C.F.R. § 264.141(h)), to perform the Work in accordance with this Consent Order or to establish a trust fund as permitted by Subparagraph 26.a.i., above, provided, however, that any company providing such a guarantee shall demonstrate to the satisfaction of the EPA that it satisfies the financial test requirements of 40 C.F.R.

§ 264.143(f) with respect to the Cost Estimate of the Work that it proposes to guarantee; or

vi. A demonstration by Ferro that Ferro meets the financial test criteria of 40 C.F.R. § 264.143(f) with respect to the Cost Estimate of the Work, provided that all other requirements of 40 C.F.R. § 264.143(f) are satisfied. To the extent Ferro intends to provide financial assurance through this mechanism, it must provide all documentation required under 40 C.F.R. § 264.143(f) prior to the Financial Assurance Due Date.

Ferro shall submit all financial assurance instruments and related required documents by certified mail to the Regional Comptroller at the address listed below. A copy shall also be sent to the EPA Project Manager.

Regional Comptroller
U.S. EPA Region 5
77 W. Jackson Blvd.
Chicago, IL 60604
Mail Code MF-10J

Ferro shall submit draft financial assurance instruments and related documents to EPA, concurrently with Ferro's submission of the Initial Cost Estimate of the Work, for EPA's review and approval. Within ten days after EPA's approval of both the Initial Cost Estimate of the Work, and the draft financial assurance instruments, whichever date is later, Ferro shall execute or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding in a form substantially identical to the financial assurance documents reviewed and approved by EPA. Ferro shall submit all executed and/or otherwise finalized instruments or other documents to EPA within thirty days after EPA's approval of the Initial Cost Estimate of the Work or the draft financial assurance instruments, whichever date is later.

Ferro shall submit to EPA all documentation necessary to demonstrate that Ferro satisfies the financial test criteria pursuant to Subparagraph 26.a.vi., concurrently with Ferro's submission of the Initial Cost Estimate of the Work. Ferro's financial assurance shall be effective immediately upon EPA's approval of the Initial Cost Estimate of the Work or Ferro's demonstration that Ferro satisfies the financial test criteria pursuant to Subparagraph 26.a.vi., whichever date is later.

If Ferro seeks to establish financial assurance by using a surety bond, a letter of credit, or a corporate guarantee, Ferro shall at the same time establish, and thereafter maintain, a standby trust fund, which meets the requirements of Subparagraph 26.a.i., above, into which funds from the other financial assurance instrument can be deposited, if the financial assurance provider is directed to do so by EPA, pursuant to Paragraph 27.b.

b. If at any time during the effective period of this Consent Order Ferro provides financial assurance for completion of the Work by means of a corporate guarantee or financial test, Ferro shall also comply with the other relevant requirements of 40 C.F.R. § 264.143(f), 40 C.F.R. § 264.151(f), and 40 C.F.R. § 264.151(h)(1) relating to these methods, unless otherwise provided in this Consent Order, including but not limited to, (i) initial submission of required financial reports and statements from the guarantors chief financial officer and independent certified public accountant; (ii) annual re-submission of such reports and statements within ninety days after the close of each of the guarantors fiscal years; and (iii) notification of EPA within ninety days after the close of any of the guarantors fiscal years in which any such guarantor no longer satisfies the financial test requirements set forth at 40 C.F.R. Part § 264.143(f)(1). Ferro further agrees that if Ferro provides financial assurance by means of a corporate guarantee or financial test, EPA may request additional information (including financial statements and accountants reports) from Ferro or corporate guarantor at any time.

c. For purposes of the corporate guarantee or the financial test described in Subparagraphs 26.a.v. and 26.a.vi., above, references in 40 C.F.R. § 264.143(f) to the sum of current closure and post-closure costs and the current plugging and abandonment cost estimates shall mean the sum of all environmental remediation obligations (including obligations under CERCLA, RCRA, UIC, TSCA and any other state or tribal environmental obligation) guaranteed by such company or for which such company is otherwise financially obligated in addition to the Cost of the Work to be performed in accordance with this Consent Order.

d. Ferro may combine more than one mechanism to demonstrate financial assurance for the Work to be performed in accordance with this Consent Order, except that mechanisms guaranteeing performance rather than payment may not be combined with other instruments.

e. Ferro may satisfy its obligation to provide financial assurance for the Work to be performed by providing a third party who assumes full responsibility for the Work to be performed and otherwise satisfies the obligations of the financial assurance requirements of this Order; however, Ferro shall remain responsible for providing financial assurance in the event such third party fails to do so and any financial assurance from a third party shall be in one of the forms provided in Subparagraphs 26.a.i. through 26.a.iv., above.

f. If at any time EPA determines that a financial assurance instrument provided pursuant to this Section is inadequate, or no longer satisfies the requirements set forth or incorporated by reference in the Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, EPA shall so notify Ferro in writing. If at any time Ferro becomes aware of information indicating that any financial assurance instrument provided pursuant to this Section is materially inadequate or no longer satisfies the requirements set forth or

incorporated by reference in the Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, then Ferro shall notify EPA in writing of such information within ten days. Within thirty days of receipt of notice of EPA's determination, or within thirty days of Ferro's becoming aware of such information, as the case may be, Ferro shall obtain and present to EPA for approval a proposal for a revised or alternative form of financial assurance listed in Paragraph 26., above that satisfies all requirements set forth or incorporated by reference in this Section. In seeking approval for a revised or alternative form of financial assurance, Ferro shall follow the procedures set forth in Paragraph 27.b., below.

g. Ferro's inability or failure to establish or maintain financial assurance for completion of the Work shall in no way excuse performance of any other requirements of this Consent Order, including, without limitation, the obligation of Ferro to complete the Work in strict accordance with the terms of this Consent Order.

h. Any and all financial assurance instruments provided pursuant to Subparagraphs 26.a.ii., a.iii., a.iv. or a.v. shall be automatically renewed at the time of their expiration unless the financial assurance provider has notified both Ferro and the EPA Project Manager at least one hundred and twenty days prior to expiration, cancellation or termination of the instrument of a decision to cancel, terminate or not renew a financial assurance instrument. Under the terms of the financial assurance instrument, the one hundred and twenty days will begin to run with the date of receipt of the notice by both the EPA and Ferro Project Managers. Furthermore, if Ferro has failed to provide alternate financial assurance and obtain written approval for such alternate financial assurance within ninety days following receipt of such notice by both Ferro and the EPA Project Manager, then the EPA Project Manager will so notify the financial assurance provider in writing prior to the expiration of the instrument, and the financial assurance provider shall immediately deposit into the standby trust fund, or a newly created trust fund approved by EPA, the remaining funds obligated under the financial assurance instrument for the performance of the Work in accordance with this Consent Order.

27. Modification of Amount and/or Form of Performance Guarantee

a. Reduction of Amount of Financial Assurance. If Ferro believes that the estimated cost to complete the remaining Work has diminished below the amount covered by the existing financial assurance provided under this Consent Order, Ferro may, at the same time that Ferro submits the annual cost adjustment, or at any other time agreed to by EPA, submit a written proposal to EPA to reduce the amount of the financial assurance provided under this Section so that the amount of the financial assurance is equal to the estimated cost of the remaining Work to be performed. The written proposal shall specify, at a minimum, the cost of the remaining Work to be performed and the basis upon which such cost was

calculated. In seeking approval of a revised financial assurance amount, Ferro shall follow the procedures set forth in Paragraph 27. of this Section. If EPA accepts Ferro's proposal, EPA shall notify Ferro of its decision in writing. After receiving EPA's written decision, Ferro may reduce the amount of the financial assurance only in accordance with and to the extent permitted by such written decision. In the event of a dispute, Ferro may reduce the amount of the financial assurance required hereunder in accordance with the final EPA Dispute Decision resolving such dispute. No change to the form or terms of any financial assurance provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraph 27.b., below.

b. Change of Form of Financial Assurance. If Ferro desires to change the form or terms of financial assurance, Ferro may, at the same time that Ferro submits the annual cost adjustment, or at any other time agreed to by EPA, submit a written proposal to EPA to change the form of financial assurance. Any written proposal for a revised or alternative form of financial assurance shall specify, at a minimum, the cost of the remaining Work to be performed, the basis upon which such cost was calculated, and the proposed revised form of financial assurance, including all proposed instruments or other documents required in order to make the proposed financial assurance legally binding. Any proposed revised or alternative form of financial assurance shall satisfy all requirements set forth or incorporated by reference in this Section and any decision to approve such alternative form of financial assurance shall be made in EPA's discretion and not subject to the Dispute Resolution provisions of Section XI. If EPA accepts Ferro's proposal to change the form of financial assurance, which acceptance shall not be unreasonably withheld if such alternative form of financial assurance meets the requirements of this Section, EPA shall notify Ferro of its decision in writing. Within thirty days after receiving a written decision approving the proposed revised or alternative financial assurance, Ferro shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding in a form substantially identical to the documents submitted to EPA as part of the proposal, and such financial assurance shall be fully effective. Ferro shall submit all executed and/or otherwise finalized instruments or other documents required in order to make the selected financial assurance legally binding to the EPA Regional Financial Management Officer within forty-five days of receiving a written decision approving the proposed revised or alternative financial assurance, with a copy to the Director, Land and Chemicals Division, U.S. EPA, Region 5, the Regional Comptroller and the EPA Project Manager. EPA shall release, cancel or terminate the prior existing financial assurance instruments only after Ferro has submitted all executed and/or otherwise finalized new financial assurance instruments or other required documents to EPA.

c. Release of Financial Assurance. Ferro may submit a written request to the Director, Land and Chemicals Division, U.S. EPA, Region 5, that EPA release Ferro from the requirement to maintain financial assurance under this Section at

such time as EPA and Ferro have both executed an Acknowledgment of Termination and Agreement on Record Preservation and Reservation of Rights pursuant to Section XVIII (Termination and Satisfaction) of the Consent Order. The Director, Land and Chemicals Division, U.S. EPA, Region 5, shall notify both Ferro and the provider(s) of the financial assurance that Ferro is released from all financial assurance obligations under this Consent Order. Ferro shall not release, cancel or terminate any financial assurance provided pursuant to this section except as provided in this Paragraph or Paragraph 27.b. In the event of a dispute, Ferro may release, cancel, or terminate the financial assurance required hereunder only in accordance with a final administrative or judicial decision resolving such dispute.

28. Performance Failure

a. In the event that EPA determines that Ferro (i) has ceased implementation of any portion of the Work, (ii) is significantly or repeatedly deficient or late in its performance of the Work, or (iii) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice (Performance Failure Notice) to both the Ferro and the financial assurance provider of Ferro's failure to perform. The notice issued by EPA will specify the grounds upon which such a notice was issued and will provide Ferro with a period of twenty days within which to remedy the circumstances giving rise to the issuance of such notice.

b. Failure by the Ferro to either remedy the relevant Performance Failure to EPA's satisfaction before the expiration of the twenty-day notice period specified in Paragraph 28.a. shall trigger EPA's right to have immediate access to and benefit of the financial assurance provided pursuant to Subparagraphs 26.a.i.- a.v., EPA may at any time thereafter direct the financial assurance provider to immediately (i) deposit into the standby trust fund, or a newly created trust fund approved by EPA, the funds obligated under the financial assurance instrument necessary to complete the Work or (ii) arrange for performance of the Work in accordance with this Consent Order.

c. If EPA has determined that any of the circumstances described in clauses (i), (ii), or (iii) of Paragraph 28.a. have occurred and EPA is nevertheless unable after reasonable efforts to secure the payment of funds or performance of the Work in accordance with this Consent Order from the financial assurance provider pursuant to this Consent Order, then, upon receiving written notice from EPA, Ferro shall within twenty days thereafter deposit into the standby trust fund, or a newly created trust fund approved by EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount equal to the estimated cost of the remaining Work to be performed in accordance with this Consent Order as of such date, as determined by EPA.

d. Ferro may invoke the dispute resolution procedures set forth in Section XI (Dispute Resolution), to dispute EPA's determination that any of the circumstances described in clauses (i), (ii), or (iii) of Paragraph 28.a. have occurred. Invoking the dispute resolution provisions shall not excuse, toll or suspend the obligation of the financial assurance provider, under Paragraph 28.b. of this section, to fund the trust fund or perform the Work. Furthermore, notwithstanding Ferro's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its reasonable discretion direct the trustee of such trust fund to make payments from the trust fund to any person that has performed the Work in accordance with this Consent Order until the earlier of (i) the date that Ferro remedies, to EPA's reasonable satisfaction, the circumstances giving rise to EPA's issuance of the relevant Performance Failure Notice or (ii) the date that a final decision is rendered in accordance with Section XI (Dispute Resolution), that Ferro has not failed to perform the Work in accordance with this Consent Order.

IX. RECORD PRESERVATION

29. Ferro will retain, during the pendency of this Order and for a minimum of six (6) years after the Order terminates, all data and all final documents now in its possession or control or which come into its possession or control which relate in any way to this Order. Ferro will notify U.S. EPA in writing ninety (90) days prior to the destruction of any such records, and provide U.S. EPA with the opportunity to take possession of such non-privileged documents. Ferro's notice will refer to the effective date, caption, and docket number of this Order and will be addressed to:

Director, LCD (L-8J)
U.S. EPA, Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

Ferro will also promptly provide a copy of any such notification to U.S. EPA's Project Manager.

30. Within thirty (30) days of retaining or employing any agent, consultant, or contractor ("Agents") for the purpose of carrying out the terms of this Order, Ferro will enter into an agreement with any such Agents whereby such Agents will be required to give Ferro a copy of all data and final non-privileged documents pursuant to this Order.

31. Ferro will not assert any privilege claim concerning any data or factual information developed in performing the work required by this Order.

32. Ferro may assert business confidentiality claims covering part of all of any documents or information submitted to EPA under this Order to the extent permitted by and in accordance with 40 C.F.R. 2.203(b). Documents or information submitted determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of

confidentiality accompanies documents or information when it is submitted to EPA, or if EPA has notified Ferro that the documents are not confidential under the standards of 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Ferro.

X. STIPULATED PENALTIES

33. Ferro will be subject to pay the following stipulated penalties to the United States for violations of this Order:

a. For failure to submit quarterly progress reports by the dates scheduled in Paragraph 20., above: $1,000 per day for the first fourteen (14) days and $2,000 per day thereafter.

b. For failure to adequately demonstrate that Current Human Exposures are Under Control by the date required in Paragraph 11.c., above: $3,000 per day.

c. For failure to adequately demonstrate that Groundwater Migration is stabilized by: the date required in Paragraph 11.c., above: $3,000 per day.

d. For failure to submit the Final Corrective Measures Proposal by the date in Paragraph 15., above: $1,000 for the first fourteen (14) days and $2,000 per day thereafter.

e. For failure to implement in accordance with the approved schedule, the selected final Corrective Measures as described in Paragraphs 18. and 19., above: $3,000 for the first fourteen (14) days and $6,000 per day thereafter.

f. For failure to submit the Final Remedy Construction Completion Report as scheduled in Paragraph 15., above: $1,000 per day for the first fourteen (14) days and $2,000 per day thereafter.

g. For failure to submit the Current Conditions Report by the date required in Paragraph 11b., above: $500 per day for the first fourteen (14) days and $1,000 per day thereafter.

h. For failure to timely submit the Cost Estimate or establish and maintain the financial assurance as required by Section VIII: $1,000 per day for the first fourteen (14) days and $2,000 per day thereafter.

34. Whether or not Ferro has received notice of a violation, stipulated penalties will begin to accrue on the day a violation occurs, and will continue to accrue until Ferro complies. For items b and c in Paragraph 33., above, stipulated penalties will not accrue during the period, if any, beginning on the date that the Environmental Indicators Report is due until the date beginning 31 days after U.S. EPA notifies Ferro in writing of any deficiency in the required demonstration(s). Separate stipulated penalties for separate violations of this Order will accrue simultaneously.

35. Ferro must pay any stipulated penalties owed to the United States under this Section within thirty (30) days of receiving U.S. EPA's written demand to pay the penalties, unless Ferro invokes the dispute resolution procedures under Section XI: Dispute Resolution. A written demand for stipulated penalties will describe the violation and will indicate the amount of penalties due.

36. Interest will begin to accrue on any unpaid stipulated penalty balance beginning thirty-one (31) days after Ferro receives U.S. EPA's demand letter. Interest will accrue at the Current Value of Funds Rate established by the Secretary of the Treasury. Pursuant to 31 U.S.C. § 3717, Ferro must pay an additional penalty of six (6) percent per year on any unpaid stipulated penalty balance more than ninety (90) days overdue.

37. Ferro must pay all penalties by certified or cashier's check payable to the United States of America, and will send the check to:

U.S. Environmental Protection Agency Fines and Penalties
Cincinnati Finance Center
P.O. Box 979077
St. Louis, MO 63197-9000

A transmittal letter stating the name of the Facility, Ferro's name and address, and the U.S. EPA docket number of this action must accompany the payment. Ferro will simultaneously send a copy of the check and transmittal letter to the U.S. EPA Project Manager.

38. Ferro may dispute U.S. EPA's assessment of stipulated penalties by invoking the dispute resolution procedures under Section XI: Dispute Resolution. The stipulated penalties in dispute will continue to accrue, but need not be paid, during the dispute resolution period. Ferro will pay stipulated penalties and interest, if any, according to the dispute resolution decision or agreement. Ferro will submit such payment to U.S. EPA within thirty (30) days after receiving the resolution according to the payment instructions of this Section.

39. Neither invoking dispute resolution nor paying penalties will affect Ferro's obligation to comply with the terms of this Order not directly in dispute.

40. The stipulated penalties set forth in this Section X do not preclude U.S. EPA from pursuing any other remedies or sanctions which may be available to U.S. EPA for Ferro's violation of any terms of this Order. However, U.S. EPA will not seek both a stipulated penalty under this Section and a statutory penalty for the same violation.

XI. DISPUTE RESOLUTION

41. The parties will use their best efforts to informally and in good faith resolve all disputes or differences of opinion arising under or in connection with this Order.

42. If either party disagrees, in whole or in part, with any decision made or action taken pursuant to this Order, that party will notify the other party's Project Manager of the dispute. The Project Managers will attempt to resolve the dispute informally.

43. If the Project Managers cannot resolve the dispute informally, either party may pursue the matter formally by placing its objections in writing. A written objection must state the specific points in dispute, the basis for that party's position, and any matters which it considers necessary for determination.

44. U.S. EPA and Ferro will in good faith attempt to resolve the dispute through formal negotiations within twenty-one (21) days, or a longer period if agreed in writing by the parties. During formal negotiations, either party may request a conference with appropriate senior management to discuss the dispute.

45. If the parties are unable to reach an agreement through formal negotiations, within fourteen (14) business days after any formal negotiations have concluded, Ferro and U.S. EPA's Project Manager may submit additional written information to the Director of the Land and Chemicals Division, U.S. EPA Region 5. U.S. EPA will maintain a record of the dispute, which will contain all statements of position and any other documentation submitted pursuant to this Section. U.S. EPA will allow timely submission of relevant supplemental statements of position by the parties to the dispute. Based on the record, U.S. EPA will respond to Ferro's arguments and evidence and provide a detailed written decision on the dispute signed by the Director of the Land and Chemicals Division, U.S. EPA, Region 5 ("U.S. EPA Dispute Decision").

46. If, at the conclusion of the Dispute Resolution process, Ferro notifies U.S. EPA that it refuses to implement U.S. EPA's selected final Corrective Measures, U.S. EPA will endeavor to pursue the action(s) it deems necessary, if any, within a reasonable period of time.

XII. FORCE MAJEURE AND EXCUSABLE DELAY

47. "Force majeure," for purposes of this Order, is defined as any event arising from causes beyond the control of Ferro, of any entity controlled by Ferro, or of Ferro's contractors that delays or prevents the performance of any obligation under this Order despite Ferro's best efforts to fulfill the obligation. The requirement that Ferro exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete an obligation under this Order or a failure to achieve protection of human health and the environment through the implementation of corrective measures.

48. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a force majeure event, Ferro will notify U.S. EPA within seven (7) days after learning that the event may cause a delay. If Ferro wishes to claim a force majeure event, within twenty (20) days thereafter Ferro must provide to U.S. EPA in writing all relevant information relating to the claim, including a proposed revised schedule.

49. If U.S. EPA determines that a delay or anticipated delay is attributable to a force majeure event, U.S. EPA will extend in writing the time to perform the obligation affected by the force majeure event for such time as U.S. EPA determines is necessary to complete the obligation or obligations and no stipulated or other penalties will accrue upon determination that any delay is attributable to a force majeure event.

XIII. MODIFICATION

50. This Order may be modified only by mutual agreement of U.S. EPA and Ferro, except as provided in Section VI - Work to be Performed. Any agreed modifications will be in writing, will be signed by both parties, will be effective on the date of signature by U.S. EPA, and will be incorporated into this Order.

XIV. RESERVATION OF RIGHTS

51. Nothing in this Order restricts U.S. EPA's authority to seek Ferro's compliance with the Order and applicable laws and regulations. For violations of this Order, U.S. EPA reserves its rights to bring an action to enforce the Order, to assess penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2), and to issue an administrative order to perform corrective actions or other response measures. In any later proceeding, Ferro shall not assert or maintain any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon a contention that the claims raised by the United States in the later proceeding were or should have been raised here. This Order is not a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, or authorities of U.S. EPA.

52. U.S. EPA reserves all of its rights to perform any portion of the work consented to here or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health or the environment.

53. If U.S. EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste or hazardous constituent(s), or a threat to human health or the environment, or that Ferro is not capable of undertaking any of the work ordered, U.S. EPA may order Ferro to stop implementing this Order for the time U.S. EPA determines may be needed to abate the release or threat and to take any action that U.S. EPA determines is necessary to abate the release or threat.

54. Ferro does not admit any of U.S. EPA's factual or legal determinations. Except for the specific waivers in this Order, Ferro reserves all of its rights, remedies and defenses, including all rights and defenses it may have: (a) to challenge U.S. EPA's performance of work; (b) to challenge U.S. EPA's stop work orders; and (c) regarding liability or responsibility for conditions at the facility, except for its right to contest U.S. EPA's jurisdiction to issue or enforce this Order. Ferro has entered into this Order in good faith without trial or adjudication of any issue of fact or law. Ferro reserves its right to seek judicial review of U.S. EPA actions taken under this Order, including a proceeding brought by the United States to enforce the Order or to collect penalties for violations of the Order.

XV. OTHER CLAIMS

55. Nothing in this Order will constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity, against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility. Ferro waives any claims or demands for compensation or payment under Section 106(b), 111, and 112 of CERCLA against the United States or the Hazardous Substance Superfund established by 26 U.S.C. § 9507 for, or arising out of, any activity performed or expense incurred under this Order. Additionally, this Order is not a decision on preauthorization of funds under Section 111(a)(2) of CERCLA.

XVI. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

56. Ferro agrees to indemnify, save and hold harmless the United States Government, its agencies, departments, agents, and employees, from all claims or causes of action arising from or on account of acts or omissions of Ferro or its officers, employees, agents, independent contractors, receivers, trustees, and assignees in carrying out activities required by this Order. This indemnification will not affect or limit the rights or obligations of Ferro or the United States under their various contracts. This indemnification will not create any obligation on the part of Ferro to indemnify the United States from claims arising from the acts or omissions of the United States.

XVII. SEVERABILITY

57. If any judicial or administrative authority holds any provision of this Order to be invalid, the remaining provisions will remain in force and will not be affected.

XVIII. TERMINATION AND SATISFACTION

58. Ferro may request that U.S. EPA issue a determination that Ferro has met the requirements of the Order for all or a portion of the Facility. Ferro may also request that U.S. EPA issue a "Corrective Action Complete" or "Corrective Action Complete with Controls" determination for all or a portion of the Facility as described at 67 Federal Register 9176, dated February 27, 2002.

59. The provisions of the Order will be satisfied upon Ferro's and U.S. EPA's execution of an "Acknowledgment of Termination and Agreement on Record Preservation and Reservation of Rights," consistent with U.S. EPA's Model Scope of Work.

60. Ferro's execution of the Acknowledgment will affirm its continuing obligation to preserve all records as required by Section IX, to maintain any necessary institutional controls or other long terms measures, and to recognize U.S. EPA's reservation of rights as required in Section XIV.

XIX. EFFECTIVE DATE

61. This Order is effective on the date that U.S. EPA signs the Order.

IT IS SO AGREED:

Date: _____ BY: _____

Name

Title
Ferro Corporation

IT IS SO AGREED AND ORDERED:

Date: 9/29/11 BY: _____

Margaret Guerriero, Director,
Land and Chemicals Division

RCRA-05-2011-0018

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 0 5 2007

REPLY TO THE ATTENTION OF: DE-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

OHD004161410
FERRO CORPORATION
7050 KRICK ROAD
WALTON HILLS, OH 44146

RE: OHD004161410
FERRO CORPORATION

Dear Plant Manager/President:

The Ohio Environmental Protection Agency (OEPA) and the United States Environmental Protection Agency (U.S. EPA) have compiled a list of all facilities deemed appropriate and important to address using the Resource Conservation and Recovery Act's (RCRA) Corrective Action Program. Because this set of 3,880 facilities has national remediation goals which will culminate in the year 2020, it is referred to as the 2020 Corrective Action Universe. **Your facility is part of this 2020 Universe.**

As a result, the OEPA and U.S. EPA expect that a final remedy will be in place (i.e. remedy construction completed) at your facility by 2020 (although actual attainment of cleanup goals through remedy implementation may take a while longer). If we have not already done so, we will be working with you to develop a plan and a schedule that achieves this goal before 2020.

Your facility has been included in the 2020 Universe because ***one or more of the following is true:***

- It already belongs to the 2008 Corrective Action Baseline,
- It has a RCRA permit obligation,
- OEPA and U.S. EPA agreed that it needs to be addressed under the RCRA Corrective Action Program.

Inclusion on this list does not imply failure on your part to meet any legal obligation, nor should it be construed as an adverse action against you. It only means that OEPA and U.S. EPA have identified your facility—and every other facility in the 2020 Universe—as needing to complete RCRA Corrective Action if they have not done so already. Our national program goal is to largely address these cleanup obligations before the end of 2020. Accordingly, progress will be tracked for each facility in the 2020 Universe. The list of facilities will be posted on our web site at http://www.epa.gov/correctiveaction on April 16, 2007.

U.S. EPA Region 5 will work to address remediation concerns at your facility in a manner consistent with your plans for the property. If you believe that facility-wide corrective actions are already complete for your site, or if you have any questions regarding this letter, please contact George Hamper at (312) 886-0987.

Sincerely,

Jose G. Cisneros, Chief
Waste Management Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

5HR-12

July 1, 1991

Mr. Steve Hofmeister
Ferro Corporation
7050 Krick Drive
Bedford, OH 44146

Re: Visual Site Inspection
Ferro Corporation - Chemical
Division, OHD 004161410

Dear Mr. Hofmeister:

The United States Environmental Protection Agency (U.S. EPA) Region V will conduct a Preliminary Assessment and Visual Site Inspection (PA/VSI) at the referenced facility. This inspection is conducted pursuant to the Resource Conservation and Recovery Act, as amended (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA). The PA/VSI requires identification and systematic review of all solid waste streams at the facility. The objective of the PA/VSI is to determine whether or not releases of hazardous wastes or hazardous constituents have occurred or are occurring at the facility which may require further investigation. This analysis will also provide information to establish priorities for addressing any confirmed releases.

The visual site inspection of your facility is to verify the location of all solid waste management units (SWMUs) and areas of concern to make a cursory determination of their condition by visual observation. The VSI supplements and updates data gathered during a preliminary file review. During this site inspection, no samples will be taken. A sampling visit to ascertain if releases of hazardous waste or constituents have occurred may be required at a later date.

Assistance of some of your personnel may be required in reviewing solid waste flow(s) or previous disposal practices. The site inspection is to provide a technical understanding of the present and past waste flows and handling, treatment, storage, and disposal practices. Photographs of the facility are necessary to document the condition of the units at the facility and the waste management practices used.

The VSI will be scheduled upon your receipt of this letter. The inspection team will consist of Guy Tomassoni and another employee of PRC Environmental Management, Inc., contractors for the U.S. EPA. Representatives of the Ohio Environmental Protection Agency may also be present. Your cooperation in admitting and assisting them while on site is appreciated.

The U.S. EPA recommends that personnel who are familiar with present and past manufacturing and waste management activities be available during the VSI. Access to any relevant maps, diagrams, hydrogeologic reports, environmental assessment reports, sampling data sheets, environmental permits (air, NPDES), manifests, or correspondence is also necessary, as such information is needed to complete the PA/VSI.

If you have any questions, please contact me at (312) 886-4448 or Sheri Bianchin at (312) 886-4446. A copy of the Preliminary Assessment/Visual Site Inspection Report, excluding the conclusions portion may be made available upon request.

Sincerely yours,

Sally Neill

for Kevin M. Pierard, Chief
OH/MN Technical Enforcement Section

cc: Dave Wertz, Ohio EPA - Northeast District
David Sholtis, Ohio EPA - Columbus
Edward Kitchen, Ohio EPA - Columbus